# Watershed Project Planning Protocol

*A step-by-step Technical Guide*

*Nine Eagles Lake*

## Plan for Better Water Quality, Step-by-step

Water quality improvements don't just happen. They take hard work, cooperation, and most of all, planning. Developing and implementing a good plan is critical to improving your watershed and your lake or stream.

The goal of the Watershed Project Planning Protocol is to assist local soil and water conservation districts (SWCDs) and other local watershed work groups in developing projects that will improve water quality in Iowa's lakes and streams.

This guide will help you build your project step-by-step. Each step builds upon the previous one, strengthening your project and improving water quality. Use this handbook as a technical reference to help you plan the details of your watershed project. Using the planning protocol will help you focus your project. A focused approach results in the most water quality improvement for the effort. It will also strengthen your application for grants from funding agencies.

This brochure will address, in detail, the nine steps of the watershed project planning protocol:

1. Identify the water quality concern
2. Determine reasonable objectives
3. Inventory watershed
4. Analyze watershed data
5. Formulate alternatives
6. Evaluate alternatives
7. Make decisions and complete the plan
8. Implement the plan
9. Evaluate the plan

# Suggested Implementation Timeframe

## Phase I

### Identify Water Quality Concerns and Objectives
**Includes Steps 1 and 2**

With the assistance of a Regional Watershed Coordinator, the local soil and water conservation district or watershed work group first begins the process of developing a watershed project by identifying local stream or lake concerns, opportunities and interest. Second, the local watershed work group determines reasonable, yet meaningful, water quality objectives for its stream or lake.

Successful completion of this phase should result in a 2-4 page application for a Watershed Development and Planning Assistance Grant. Items to be contained in the application should include:

- Map of waterbody and watershed.
- Listing of the physical characteristics of the watershed/waterbody and its location.
- Report on potential landowner/stakeholder interest in a watershed project.
- Local commitment to carry out a watershed project.

Landowners and the public should be made aware of this phase through public presentations, tours, IOWATER volunteer water monitoring, school programs, etc.

## Phase II

### Develop a Watershed Plan
**Includes Steps 3 – 7**

This phase contains the "meat" of any watershed project. Developing a plan for success includes measurable goals and a roadmap for achieving those goals. Technical partners DNR, DSC and NRCS will provide planning assistance to local sponsors in the form of funding and a trained watershed planner to:

- Inventory the watershed
- Evaluate the watershed data
- Formulate various alternatives
- Evaluate the best alternatives
- Make decisions and write a watershed plan

All of these steps are conducted with the active participation of the SWCD and the watershed work group. The local watershed work group will review the work of the watershed planner, provide local input and guidance, and make final decisions. Keeping local landowners and other stakeholders informed and involved in the process is critical to project success.

Finally, the watershed planner can assist with the development of a project application that can be submitted to the funding agencies to implement the watershed plan.

## Phase III

### Implement the Plan and Evaluate
**Includes Steps 8 and 9**

Once the project has identified technical and/or financial resources, implement the approved watershed plan. The project may need to hire staff and make other decisions. Local sponsors must evaluate progress of the project and if the project is targeting its priorities. Sponsors also must be prepared to consult with the funding partners about any necessary adjustments that may be needed.

The project will need to prepare and submit regular reports to the funding agencies. Continue to update local landowners and stakeholders on project progress.

## Acronyms used in this guide

DNR: Iowa Department of Natural Resources
DSC: Division of Soil Conservation, Iowa Department of Agriculture and Land Stewardship
NRCS: Natural Resources Conservation Service, U.S. Department of Agriculture
SWCD: Soil and Water Conservation District

# Identify Concerns and Determine Objectives

## Phase I: Step 1

### Identify Water Quality Concerns, Opportunities and Interest

The local work group initiates the process. The Regional Watershed Coordinator will help identify where to find data to answer these questions:

| Things to Consider | Responsible Party* |
|---|---|
| Is the waterbody a local priority, is there special significance to the local stakeholders, and are they motivated individually and collectively to improve the lake/stream water quality? | SWCD, County Conservation Board, local work group |
| What is the pollutant? (see DNR Integrated Report, i.e. 305(b) report)<br>• Is the problem sediment or turbidity?<br>• If bacteria, identify possible sources.<br>• If excess nutrients, identify sources such as livestock and publicly owned treatment works (POTW).<br>• If nitrates, identify drainage, land use, etc.<br>• If atrazine, identify land use, retention time, etc. | SWCD, local work group |
| What, specifically is being impacted by the pollutant? (see DNR 305(b) report) | SWCD, local work group |
| Is the waterbody on the impaired waters list? (see DNR 303(d) list) | SWCD, local work group |
| Is the waterbody on Iowa's priority streams and lakes list? (see DNR Nonpoint Source Plan) | SWCD, local work group |
| Is the waterbody a source of drinking water? (see DNR water supply section) | SWCD, local work group |
| Is the waterbody a major recreation area? | SWCD, local work group |
| What is the designated use for the waterbody? (see DNR water quality bureau) | SWCD, local work group |
| Are there significant future plans for the watershed/waterbody? | SWCD, NRCS, DNR, County Conservation Board, local work group |
| What monitoring data is available? (see DNR water monitoring section, IOWATER, USGS, utilities) | SWCD, local work group |

## Phase I: Step 2

### Determine Reasonable, Yet Meaningful, Water Quality Objectives

The local work group determines its objectives for the watershed and waterbody, considering the designated uses defined in Iowa's water quality standards. The local work group may need technical assistance with this step. Objectives should be quantifiable in order to measure progress. Objectives may include the following:

| Things to Consider | Responsible Party* |
|---|---|
| Maintain/improve the integrity of the waterbody by preventing future degradation | SWCD or local work group |
| Reduce pollutant load to an acceptable level or to the allocation assigned in a TMDL | SWCD or local work group |
| Measurably improve in-stream habitat conditions | SWCD, local work group, DNR Fisheries |
| Measurably improve in-lake habitat conditions | SWCD, local work group, DNR Fisheries |
| Meet/maintain the designated use for the waterbody | SWCD, local work group, DNR Fisheries |
| Measurably improve recreational opportunities and economic benefits | SWCD, local work group, County Conservation Board, DNR Fisheries, DNR Parks |

* Technical partners DNR, DSC and NRCS may also be able to provide information or assistance with each of these items.

# Inventory Watershed

## Phase II: Step 3

### Inventory Watershed

At this phase of the project, the technical partners* have approved a Development and Planning Assistance Grant for the watershed project. A watershed planner will provide assistance for the watershed inventory. The watershed planner will help the local work group determine which of the following activities are necessary:

| Physical | Responsible Party* |
|---|---|
| Identify land use, soils, slopes, and other RUSLE/RUSLE2 factors; size of the watershed will determine the detail required (see DNR GIS staff) | Watershed Planner, SWCD, local work group |
| Smaller watersheds (generally less than 25,000 acres) should receive a field-by-field assessment | Watershed Planner, SWCD, local work group |
| Larger watersheds (generally greater than 25,000 acres) should have an assessment designed by technical partners that meets the specific traits of the watershed | Watershed Planner, SWCD, local work group |
| DNR will enter applicable resource data into GIS format | DNR |
| Run the Sediment Delivery Model and/or SWAT model to determine priority areas and loading estimates | DNR, NRCS |
| Examine streams using "Rapid Assessment of Stream Conditions Along Length" (RASCAL) or other models to determine priority areas; size of the watershed will determine the detail required | Watershed Planner, SWCD, local work group |
| Evaluate topography using digital elevation model (DEM) or Light Detection and Ranging (LiDAR) data | Watershed Planner, SWCD, local work group |
| Determine gully and streambank/bed erosion potential (Erosion and Sediment Delivery Procedure) to determine priority areas and loading estimates; size of the watershed will determine the detail required; assessment designed by the technical partners to meet the specific traits of the watershed | Watershed Planner, SWCD, local work group |
| Identify livestock operations (pasture and feedlot) and waste application methods to determine priority areas and loading estimates; assessment designed by the technical partners to meet the specific traits of the watershed | Watershed Planner, SWCD, local work group |
| Identify organized drainage district "watersheds" and outlets if present (DSC, county, Watershed Atlas) | Watershed Planner, SWCD, local work group |
| Identify other potential point and nonpoint issues, specific to individual watersheds (superfund sites, brownfield sites, leaking underground storage tanks, etc.) | Watershed Planner, SWCD, local work group, DNR Contaminated Sites |
| Assess urban contributions (percent impervious cover, unsewered communities, construction sites, etc.) | Watershed Planner, SWCD, local work group, city |
| In urban watersheds, identify storm drain discharge points, associated intakes and watersheds for each. | Watershed Planner, SWCD, local work group, city |
| In urban watersheds, identify potential pollutant sources that may be reaching the storm drain system. | Watershed Planner, SWCD, local work group, DNR Field Office, city |
| Identify all NPDES permits and compliance record of all point sources that may have an influence on the waterbody/watershed. | Watershed Planner, SWCD, local work group, DNR Field Office |
| Identify any influence wildlife in the watershed may have on water quality. | Watershed Planner, DNR wildlife |

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| Social | Responsible Party* |
|---|---|
| Survey landowners to determine what conservation practices and financial incentives they desire and secure their participation in the decision-making process | SWCD, local work group |
| Survey the public to determine the level and extent of stakeholder interest and knowledge about watershed/waterbody issues and secure their participation in the decision-making process | SWCD, local work group |
| Conduct a kickoff meeting to introduce the potential of a water quality project to landowners and the public | SWCD, local work group |
| Determine any local or statewide political assets or liabilities with a potential project | SWCD, local work group |
| Share survey results with the public to build a sense of community and purpose | SWCD, local work group |

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| Financial | Responsible Party* |
|---|---|
| Determine the level of potential financial commitment from local sources (landowners, residents, local interest groups, utilities, non-governmental organizations (NGOs), counties, cities, etc.) | SWCD, local work group |
| Identify funding agency support for a full watershed project | SWCD, local work group |
| Explore other sources of financial support for a watershed project (NGOs, foundations, in-kind contributions, etc.) | SWCD, local work group |
| Identify interests and priorities that other agencies and organizations may have in the watershed and what resources they may have to offer | Watershed Planner, SWCD, local work group, DNR Fisheries, DNR Forestry, DNR Wildlife |

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*Badger Creek Lake watershed*

# Analyze Watershed Data

## Phase II: Step 4

### Analyze Watershed Data

The watershed planner will assist with collecting technical, personnel and financial resources necessary to accomplish the data analysis.

| Things to Consider | Responsible Party* |
|---|---|
| Verify loading estimates previously produced to assure accuracy | Watershed Planner, SWCD, local work group |
| Analyze gathered data to determine if it supports the initial concerns and objectives | Watershed Planner, SWCD, local work group |
| Verify priority parcels/landowners for participation | Watershed Planner, SWCD, local work group |
| Examine survey results for stakeholder and priority landowner understanding and willingness to participate | Watershed Planner, SWCD, local work group |
| Evaluate recent and future trends that may affect the project's success (CRP contract expiration or acreage limitations, CSP opportunities, new programs, etc.) | Watershed Planner, SWCD, local work group |
| Determine geographic and issue priorities for a project, given the watershed/waterbody data collected | Watershed Planner, SWCD, local work group |
| Evaluate the influence NPDES permits may have on the waterbody | Watershed Planner, SWCD, local work group, DNR water quality bureau |
| Re-evaluate objectives in light of the analyzed data to determine if they are feasible | Watershed Planner, SWCD, local work group |

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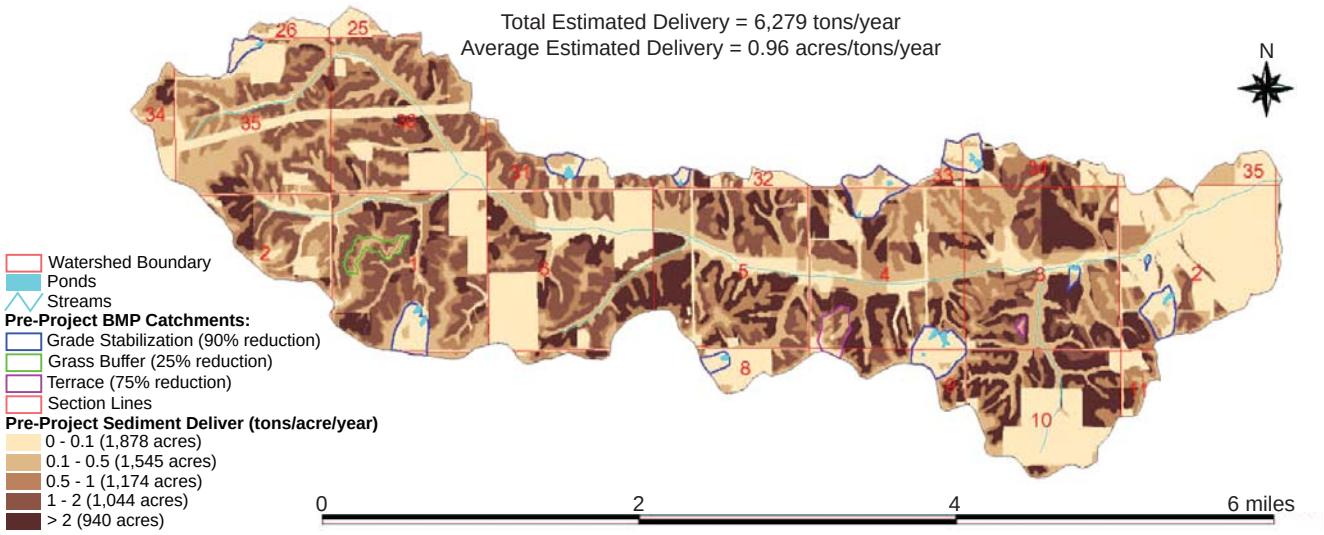
**Example**



# Formulate Alternatives

## Phase II: Step 5

### Formulate Alternatives

Alternatives are resource management options developed to solve the identified water resource problems. Seldom will one approach be sufficient. Rather a combination of approaches, each with its advantages and disadvantages, must be considered.

| Things to Consider | Responsible Party* |
|---|---|
| Ensure proposed alternatives address identified objectives and concerns | Watershed Planner, SWCD, local work group |
| Develop alternatives that are financially and technically feasible | Watershed Planner, SWCD, local work group |
| Include alternatives that are "program neutral" so funding program rules do not constrain the search for innovative solutions | Watershed Planner, SWCD, local work group |
| Consider and include regulatory alternatives where appropriate, as well as voluntary activities | Watershed Planner, SWCD, local work group |
| Alternatives may include in-stream or in-lake work as well as conservation practices located in the watershed | Watershed Planner, SWCD, local work group |
| Each alternative should be summarized including costs, pollutant reduction effectiveness and potential locations | Watershed Planner, SWCD, local work group |

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*Trout Run watershed*

# Evaluate Alternatives

## Phase II: Step 6

### Evaluate Alternatives

Alternatives are evaluated to determine how effective they are in meeting objectives, the cost, how feasible they are to accomplish, and whether they are acceptable to landowners and the public.

| Things to Consider | Responsible Party* |
|---|---|
| Evaluate feasibility based upon social, financial, technical and political considerations | Local work group, SWCD, Watershed Planner |
| Evaluate the impacts of alternatives upon such things as wildlife habitat, threatened and endangered species, cultural resource sites, etc. | Local work group, SWCD, Watershed Planner |
| Evaluate the impact of alternatives upon other pollutant sources and groundwater (e.g., tile inlet terraces reduce sediment, but may worsen atrazine problems) | Local work group, SWCD, Watershed Planner |
| Inventory and analysis work (steps 3 and 4) needs to support the evaluation of alternatives | Local work group, SWCD, Watershed Planner |
| Conduct a stakeholder meeting to gather input on problems, objectives and alternatives within the watershed | Local work group, SWCD, Watershed Planner |
| Evaluate alternatives by asking if a given component is essential to the success of the project, or just nice to have | Local work group, SWCD, Watershed Planner |
| Consider the popularity/acceptability of various BMPs within the watershed | Local work group, SWCD |
| Rank the effectiveness of various alternatives to determine which alternatives have the most merit | Local work group, SWCD, Watershed Planner |

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*Slip Bluff Lake watershed*

# Complete Planning Process

## Phase II: Step 7

### Make Decisions and Complete the Planning Process

The local work group, in consultation with stakeholders and the watershed planner, should lead decision making. The decisions made at this level will become an application to funding agencies/organizations. The plan will identify priorities and target cost-effective alternatives for measurable results. Development of the work plan will comprise the full application for a fundable project.

| Things to Consider | Responsible Party* |
|---|---|
| Review all of the alternatives and evaluate their value to the project | Watershed Planner, SWCD, local work group |
| Choose alternatives that are cost-effective | Watershed Planner, SWCD, local work group |
| In many cases, the final plan may include a blend of alternatives | Watershed Planner, SWCD, local work group |
| Decisions should be documented in an area-wide or watershed project plan. This plan should support funding applications for one or more programs, but probably will have to be modified to meet specific funding program application criteria. | Watershed Planner, SWCD, local work group |
| Determine local funding, leadership, in-kind contributions, etc. | Watershed Planner, SWCD, local work group |
| Determine how progress will be analyzed during the project and at the end of the project. Measures may include monitoring, models, practices installed, park user days, etc. | Watershed Planner, SWCD, local work group |
| Incorporate selected alternatives, staffing, technical assistance, funding, etc. into a final work plan | Watershed Planner, SWCD, local work group |
| Solicit/select the combination of program and funding sources needed to maximize local contributions to achieve project objectives | Watershed Planner, SWCD, local work group |
| Meet with landowners and other watershed stakeholders to gain input and support for the final watershed plan | Watershed Planner, SWCD, local work group |

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*Badger Creek Lake watershed*

# Implement the Plan

## Phase III: Step 8

### Implement the Watershed Plan

Watershed projects are meant to evoke change: change in management, change in attitude, change in water quality. To create this change, projects must develop a water quality project by implementing the final plan of selected alternatives, prioritizing their implementation and soliciting funding sources to carry out the plan.

| Things to Consider | Responsible Party* |
|---|---|
| Enlist necessary staff and technical assistance (consider skills, time needed, etc.) | SWCD, local work group |
| Design an information and education component to keep all stakeholders up to date on project developments and progress | Project staff, SWCD, local work group |
| Develop and use visual tools to explain water quality problems and the implementation plan to landowners and stakeholders | Project staff, SWCD, local work group |
| Kick off project with meeting of landowners and stakeholders | Project staff, SWCD, local work group |
| Continue to keep stakeholders, funding agencies, landowners, NGOs and others informed | Project staff, SWCD, local work group |

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*Deer Creek watershed*

# Evaluate The Plan

## Phase III: Step 9

### Evaluate the Plan

Measure the progress toward project objectives both during the project as well as at the end of the project and make necessary adjustments in order to achieve success.

| Things to Consider | Responsible Party |
|---|---|
| Periodically determine if the project is on schedule | SWCD, local work group |
| Periodically determine if the project is satisfying the priorities set out in the work plan | SWCD, local work group |
| Determine the adjustments necessary to meet the schedule and priority objectives of the project (participation rate, accurate assumptions, technology changes, etc.) | SWCD, local work group, project staff |
| Report progress to funding partners on a regular basis | Project staff, SWCD, local work group |
| Collect quantifiable evaluation data described in the work plan | Project staff, SWCD, local work group |
| Calculate evaluation measures on a regular basis (practices installed, modeled or monitored load reductions, park user days, etc.) | Project staff, SWCD, local work group |
| Complete evaluation at the end of the project to determine level of success - what aspects of the project worked well and not so well? | Project staff, SWCD, local work group |
| Submit final report to funding organizations and local partners | Project staff, SWCD, local work group |
| Continue to evaluate the long-term impact of the project after its completion | SWCD, local work group |

*Clear Creek watershed*

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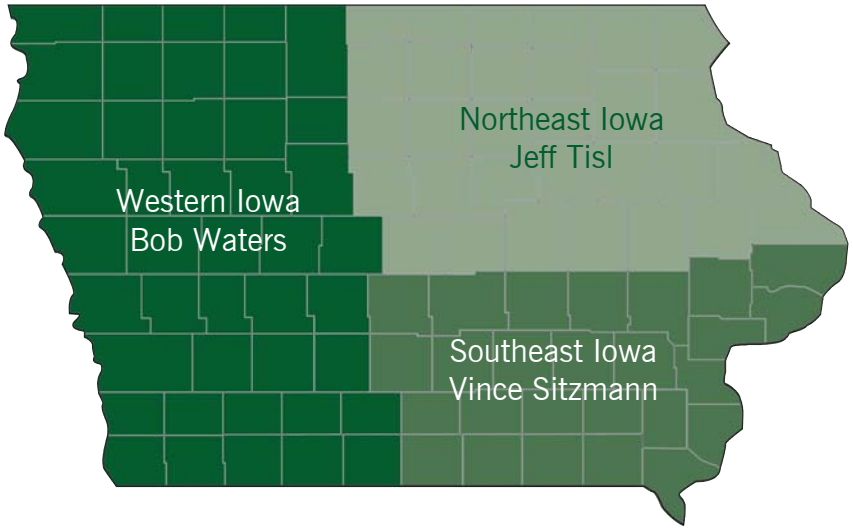



*Badger Creek Lake watershed*


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